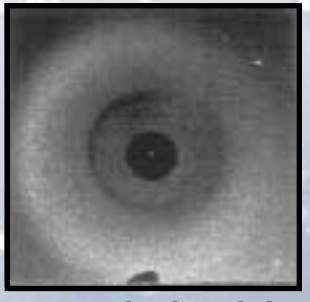
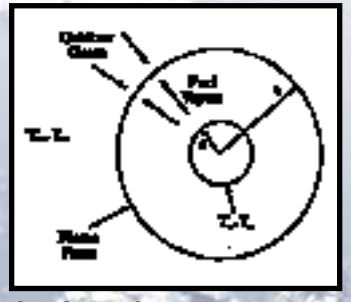
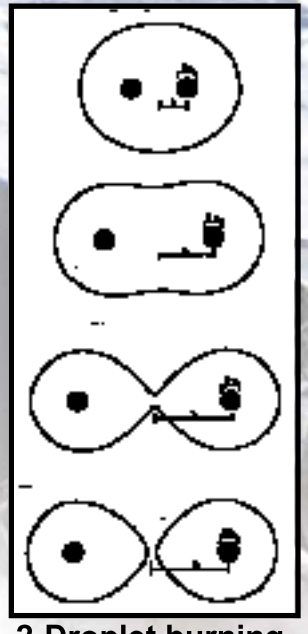
Glenn Research Center

Combustion of Heterogeneous and Homogeneous Suspensions

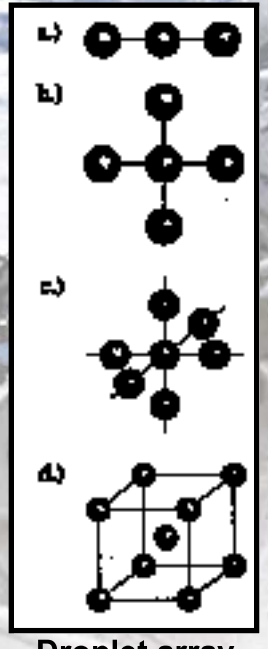




Isolated droplet burning



2-Droplet burning at various spacings



Droplet array arrangements

- **Definition**
  - Burning of a liquid droplet or solid particle in isolation or near other droplets and particles
  - Burning of flammable gases in a cloud of inert particles or droplets
  - Synthesis of exotic solid materials
- **Scientific Issues**
  - What leads to unsteady behavior, extinction, disruptive burning, soot production, burning rates in spherically-symmetric droplet combustion in various environments (e.g. near critical point, in depleted or enhanced oxygen concentrations)?
  - How does droplet or particle spacing, size distribution, volatility, and ambient conditions affect burning rates and energy release?
  - How does buoyancy influence the synthesis, yield and properties of exotic materials (e.g. fullerenes, ceramic-metal matrices)?
- **Applications/Benefits**
  - Verification of longstanding theories about droplet(s) combustion
  - Better understanding of spray and cloud combustion which takes place in diesel engines, mine fires and explosions
  - New process methods for many materials